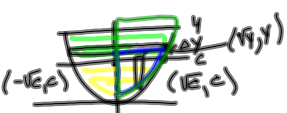


41 $y = x^2$, $y = 4$, $y = c$
 wrt: y
 $\Delta A = 2\sqrt{y} \Delta y$
 $A = \int 2\sqrt{y} dy$
 $2 \int_c^4 2\sqrt{y} dy = \int_0^4 2\sqrt{y} dy$
 $4 \cdot \frac{2}{3} y^{3/2} \Big|_c^4 = 2 \cdot \frac{2}{3} y^{3/2} \Big|_0^4$
 $\frac{8}{3} (4^{3/2} - c^{3/2}) = \frac{4}{3} \cdot 4^{3/2} - 0$
 $4^{3/2} - c^{3/2} = \frac{4}{8} \cdot 4^{3/2} - 4^{3/2}$
 $4^{3/2} - c^{3/2} = \frac{1}{2} 4^{3/2}$
 $-c^{3/2} = -\frac{1}{2} 4^{3/2}$
 $c^{3/2} = \frac{1}{2} 4^{3/2}$
 $c = \left(\frac{1}{2} 4^{3/2}\right)^{2/3} = 4$
 $\sqrt[3]{4m} = \frac{1}{\sqrt[3]{4}} \cdot 4$
 $= \frac{4}{\sqrt[3]{4}} = 4^{2/3}$

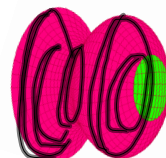
wrt: x $\Delta A = (c - x^2) \Delta x$
 $\int_{-c}^c c - x^2 dx = \frac{1}{2} \int_{-4}^4 4 - x^2 dx$
 $c x - \frac{x^3}{3} \Big|_{-c}^c = \frac{1}{2} \left(4x - \frac{x^3}{3} \right) \Big|_{-4}^4$
 $c(2 - \frac{c^3}{3}) = \frac{1}{2} (8 - \frac{8}{3})$
 $\frac{2}{3} c^{3/2} - \frac{c^{3/2}}{3} = \frac{1}{2} \cdot \frac{16}{3}$
 $\frac{2}{3} c^{3/2} = \frac{8}{3}$
 $(c^{3/2})^{2/3} = \left(\frac{8}{3}\right)^{2/3}$
 $c = 4^{2/3}$



Dec 9-9:24 AM

7.3a Volumes

How could we find/approximate the volume of the solid?



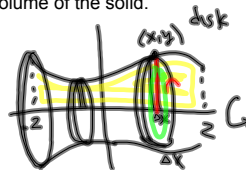
Dec 15-5:19 PM

Volumes of known cross section

$$V = \int_a^b A(x) dx$$

↑
area of cross section

The region between the graph of $f(x) = x \cos(x) + 2$ and the x -axis over the interval $[-2, 2]$ is revolved about the x -axis to generate a solid. Find the volume of the solid.



$$\Delta V = \pi r^2 \Delta x$$

$$V = \int_a^b \pi r^2 dx$$

disks

we need r in terms of x

$$V = \int_{-2}^2 \pi (x \cos(x) + 2)^2 dx$$

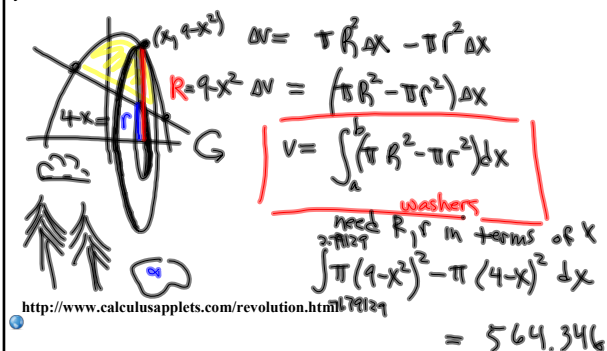
52.429

<http://www.calculusapplets.com/revolution.html>

Dec 15-6:07 PM

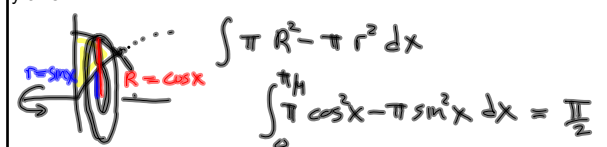
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Find the volume of the object generated by revolving $y = 9 - x^2$ and $y = 4 - x$ about the x-axis.

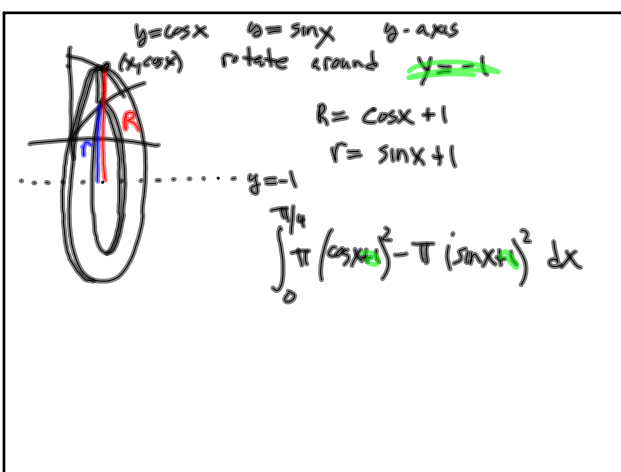


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The region in the first quadrant enclosed by the y-axis and the graphs of $y = \cos(x)$ and $y = \sin(x)$ is revolved about the x-axis to form a solid. (a) Find its volume. (b) Find the volume if the region is revolved about the y-axis.



Dec 15-6:53 PM



Dec 9-10:29 AM